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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,252	08/17/2001	Takashi Yano	520.40478X00	1490

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EXAMINER

LAMARRE, GUY J

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 04/07/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,252

Applicant(s)

YANO ET AL.

Examiner

Guy J. Lamarre, P.E.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 24 March 2004 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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FINAL OFFICE ACTION

0. Applicant's amendment along with the granted petition for extension of time and IDS of 24 March 2004 has been entered. The Examiner has considered the IDS. This office action is in response to Applicants' amendment.

0.1 **Claims 1-6** remain pending.

0.2 The objections and rejections of record are withdrawn in response to Applicants' amendment.

Response to Arguments

1. Applicants' arguments have been fully considered and they are deemed persuasive only to the extent that **Suzuki et al.** is not antecedent to effective filing date of instant application. **However, FREEMAN** (EP No. 973292A2; January 19, 2000) of IDS of 24 March 2004 is antecedent thereto.

Claim Rejections - 35 USC § 103

2.1 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2.2 This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2.3 Claim(s) 1-4 is/are rejected under 35 U.S.C. 103(a) as being unpatentable over FREEMAN et al. (EP No. 973292A2; January 19, 2000).

As per claim 1, FREEMAN substantially teaches, in Fig. 5 and related description, turbo decoder means for application of input turbo-encoded data; of repeatedly carrying out turbo decoding a number of times to restore the originally transmitted data; of judging the reliability of

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the soft outputted decoded result from statistics of the soft output result; of calculating the root mean square (a statistical measure) of the soft output and comparing (or judging) the result; of controlling the number of iterations to run based on the judgment result; of repeating the turbo decoding in accordance with the comparison result of the root mean square. Hence FREEMAN teaches of controlling the number of iterations (repetitions) based on the judgment result.

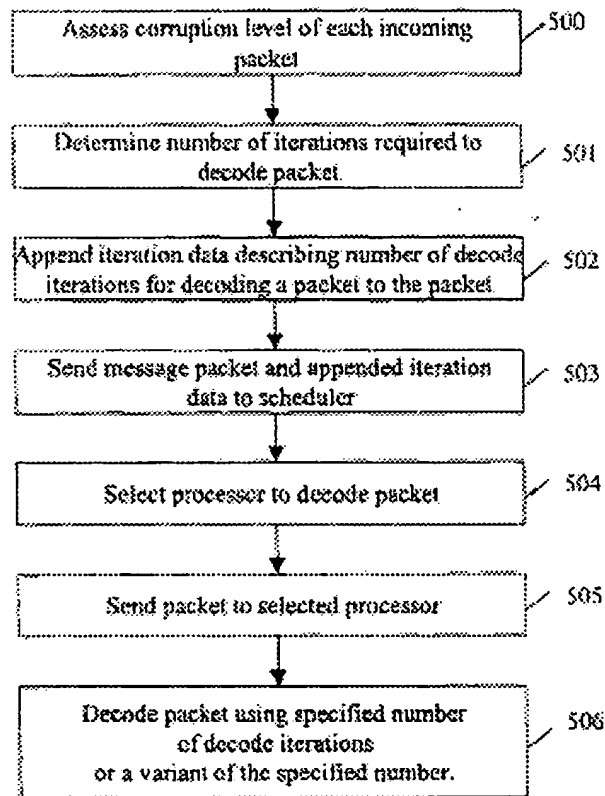


Fig. 5

FREEMAN does not explicitly teach of using the turbo encoding to correct errors.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use turbo-encoded data to help correct errors. It would have been obvious to one of ordinary skill because it is well known that error-correcting codes (such as turbo codes) are used to help detect and/or correct errors in transmitted data.

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As per claim 2, FREEMAN, as noted above in claim 1, substantially teaches the limitations of claim 2. With respect to the limitations of claim 2, FREEMAN teaches of a signal-to-noise ratio estimation section used to estimate the signal-to-noise ratio of data on the basis of reliability information from the decoding section. The limitations of claim 2 are, as disclosed on page 9 of the specifications, comparing the signal power and noise power of a decoded data. With this in mind, the Examiner is reading the teachings of FREEMAN to teach of comparing signal and noise power (as a ratio) and using the outcome of the comparison to carry out the repetition of the turbo decoding, e.g., at paras. 6-9.

As per claim 3, FREEMAN, as noted above in claim 1, substantially teaches the limitations of claim 3. With respect to the limitations of claim 3, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the comparison of the mean and minimum values of the soft output decoder as judging means. The limitations of claim 3 are comparing the minimum and the mean (average) values of the soft output decoder. It would have been obvious to one of ordinary skill in the art to use the observed mean and minimum values to help determine if further iterations/repetitions would be required. By comparing the minimum value and the mean (or average) value, one of ordinary skill would be able to determine how close or far the two values are from each other. If, for instance, the observed minimum value were much less than the mean value, then it would be obvious to one of ordinary skill that the reliability would be low and therefore would require more iterations. Further, if as described in figure 5 of the specifications, the minimum value multiplied by a constant was less than the mean, it is clear that the minimum value is (still) much smaller than the mean. Conversely, if the minimum value multiplied by a constant was greater than the mean, it would imply that the minimum value is closer, relatively speaking, to the mean value and hence have a higher reliability and not require more iterations.

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As per claim 4, FREEMAN, as noted above in claim 1, substantially teaches the limitations of claim 4. With respect to the limitations of claim 4, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the comparison of the maximum and minimum values of the soft output decoder as judging means. The limitations of claim 4 are comparing the maximum and minimum values of the soft output decoder. It would have been obvious to one of ordinary skill in the art to use the observed maximum and minimum values to help determine if further iterations/repetitions would be required. By comparing the maximum and minimum values, one of ordinary skill would be able to determine how far apart or close to each of the extreme values of the decoder are to one another. Obviously, the maximum value will always be greater than the minimum, but the use of their difference or ratio can be used to determine how close or far the two values are from each other. If, as described in figure 6 of the specifications, the minimum value multiplied by a constant were compared to the maximum value, it would have been obvious that if the min. value times the constant were greater than the maximum value, then the two values are relatively close and would require fewer, if any, extra iterations.

2.4 Claim(s) 5 and 6 is/are rejected under 35 U.S.C. 103(a) as being unpatentable over FREEMAN in view of Dissosway et al. U.S. Patent No. 4,903,262 (hereinafter Dissosway).

As per claims 5 and 6, FREEMAN substantially teaches of a turbo decoder that decodes turbo encoded data in Fig. 5 of judging the reliability of the soft outputted decoded result from statistics of the soft output result and of controlling the number of iterations to run based on the judgment result.

FREEMAN does not teach of the turbo decoder being part of a transmitter/receiver in a mobile communication system. Nonetheless, FREEMAN does teach of turbo codes being used in mobile communications to help improve error correcting ability in the transmission path.

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Dissosway, in an analogous art, teaches of radio frequency circuit for transmitting and receiving radio frequency signals, a digital signal processor and a receiver (as part of the transceiver (transmitter-receiver), see column 31, claim 17, lines 15-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the turbo receiver of FREEMAN to the transceiver Dissosway. This modification would have been obvious because one of ordinary skill in the art would have been motivated by the suggestion provided by FREEMAN to use turbo encoders and decoders to help improve the error correcting ability of the communication path of mobile communication systems (or the like), see page 1, paragraph 2. Clearly, from the abstract of Dissosway, the system of Dissosway is a mobile communication system with mobile transceivers and mobile terminals

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

3.0 The new ground of rejection was based on information presented in the information disclosure statement of 24 March 2004 under 37 CFR 1.97(c) where no certification was filed. See MPEP § 706.07(a). Thus, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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3.1 Any response to this action should be mailed to:

Commissioner of Patents and Trademarks, Washington, D.C. 20231

or faxed to: (703) 872-9306 for all formal communications.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Fourth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guy J. Lamarre, P.E., whose telephone number is (703) 305-0755. The examiner can normally be reached on Monday to Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert De Cady, can be reached on (703) 305-9595.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Guy J. Lamarre, P.E.

Patent Examiner

3/31/04
